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| 10/501,209 | 01/06/2005 | Robert Furst | MAIKP141WOUS | 3577 |
| 7590 09/17/2007 | | | | |
| Thomas G Eschweiler Eschweiler & Associates National City Bank Building Suite 1210 629 Euclid Avenue Cleveland, OH 44114 | | | | |
| EXAMINER | | | | |
| HA, NATHAN W | | | | |
| ART UNIT | | PAPER NUMBER | | |
| 2814 | | | | |
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/501,209

Applicant(s)

FURST ET AL.

Examiner

Nathan W. Ha

Art Unit

2814

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 July 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 14-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 14-21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SF/ICE)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 14-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over the Applicant's Admitted Prior Art, figure 7, hereinafter, AAPA, and in view of Nishizawa (US 4,636,647, newly cited.)

In regard to claims 14 and 20, in fig. 7, the AAPA discloses a photodiode arrangement, comprising:

a photodiode 112; and

-

a submount 116 that is electrically contact-connected to the photodiode,

wherein the photodiode comprises a metallization on a side facing the submount, the submount comprises a metallization on a side facing the photodiode.

This is a flip-chip type connection. See also the prior art discussion on page 3, first paragraph of the Applicant's specification. The AAPA, however, does not explicitly describe the connection as a eutectic mixture connection. The eutectic mixture is widely used and common in the art. It is a mixture of two different materials, for example AuSn mixture. The compound provides a lower melting point compared to single material layer. For instance, Nishizawa, in fig. 9, discloses an analogous device and further use

a eutectic mixture such as AuSn compound layer 51 for the connection between the photodiode 59 and the element 52 in order to provide a low melting point mixture therein.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to use a common mixture of materials as taught by Nishizawa in the AIPA in order to take the advantage as mentioned.

In regard to claim 15, the metal marks on the element 116 are capable of functioning as an alignment mark. Figure 7.

In regard to claim 16, wherein the photodiode comprises a silicon chip, 102, for example.

In regard to claim 17, wherein the photodiode and the submount each have an outer contour that differs from one another and, accordingly, comprise regions that protrude relative to one another. See fig. 7.

In regard to claim 18, figure 7 further comprising contact pads situated on a region of the submount that protrudes with respect to photodiode, wherein the pads should protrude in order to make the flip-chip connection between the diode and the submount device.

In regard to claim 19, wherein the photodiode comprises an optically active area situated on a region of the photodiode that protrudes with respect to the submount. See fig. 7.

In regard to claim 21, Nishizawa further teaches that wherein one of the photodiode and the submount comprise a trench or window 53 to ensuring a connection

between the photodiode and the submount only in defined regions not associated with the trench. See Nishizawa's figs. 6 and 9.

Response to Arguments

3. Applicant's arguments with respect to claims 14-21 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

4. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nathan W. Ha whose telephone number is (571) 272-1707. The examiner can normally be reached on M-TH 8:00-7:00(EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on (571) 272-1705. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Nathan W. Ha/
Primary Examiner, Art Unit 2814